WHAT IS CLAIMED IS:

1. A photon operating device characterized in using dual signals correlated to each other, which are obtained by dividing a photon beam.

2. The photon operating device according to claim 1 wherein paths of photons are disposed in a two-dimensional plane, and one of said dual signals is transmitted through within said paths whereas the other of said dual signals is led out from said paths externally of said two-dimensional plane.

3. The photon operating device according to claim 1 wherein paths of photons are provided by a plurality of first optical fibers or optical waveguides and a plurality of second optical fibers or optical waveguides that are disposed in form of a grating in a two-dimensional plane,

a photon beam introduced into selected one of said plurality of first optical fibers or optical waveguides being divided to create said dual signals correlated to each other, one of said dual signals being transmitted through within selected said first optical fiber or optical waveguides, the other of said dual signals being led out from selected said first optical fiber or optical waveguide externally of said two-dimensional plane and again introduced into selected said first optical fiber or optical waveguide via selected one of said plurality of second optical

fibers or optical waveguides to join with said one of the dual signals.

4. The photon operating device according to claim 1 wherein paths of photons are provided by a plurality of first optical fibers or optical waveguides and a plurality of second optical fibers or optical waveguides that are disposed in form of a grating in a two-dimensional plane,

one of said dual signals being transmitted through within selected said first optical fiber or optical waveguides, the other of said dual signals being led out from selected said first optical fiber or optical waveguide externally of said two-dimensional plane,

one of said dual signals, which is an inversion signal of the other of said dual signals led out externally of said two-dimensional plane, being stored in storage means synchronously with leading out the other of said dual signals externally of said two-dimensional plane.

5. The photon operating device according to claim 4 wherein the other of said dual signals led out externally of said two-dimensional plane is an image signal.

6. The photon operating device according to claim 4 wherein said image signal is recognized and/or analyzed by acquiring difference in time and/or space

of said inversion signal.

7. The photon operating device according to claim 4 wherein a result of recognition and/or analysis of said image signal is fed back to an image signal for the next display.

8. The photon operating device according to claim 4 wherein said inversion signal contains information about optical intensity, color or polarization.

9. The photon operating device according to claim 4 wherein said inversion signal is used for analysis of time and space for physical access to said two-dimensional plane from the exterior.

10. The photon operating device according to claim 9 wherein said physical access is an external pressure.

11. The photon operating device according to claim 9 wherein a position of said physical access on said two-dimensional plane is detected by using the other of said dual signals as a guide signal for a user and using said inversion signal as a signal carrying information for said physical access.

12. The photon operating device according to claim 4 wherein a light source and a photo detector are disposed at one and the other ends of each said first optical fiber or optical waveguide.

13. The photon operating device according to

claim 12 wherein said photo detector is connected to a shift register.

14. The photon operating device according to claim 12 wherein said light source is a semiconductor laser or a light emitting diode.

15. The photon operating device according to claim 12 wherein said photo detector is a charge coupled device.

16. The photon operating device according to claim 2 wherein an optical switch is used to lead out the other of said dual signals externally of said two-dimensional plane.

17. A photon operating device using dual signals correlated to each other, which are obtained by dividing a photon beam, comprising:

a plurality of first optical fibers or optical waveguides and a plurality of second optical fibers or optical waveguides that are disposed in form of a grating in a two-dimensional plane; and

a light source and a photo detector disposed at one and the other ends of each said first optical fiber or optical waveguide,

a photon beam introduced from said light source into selected one of said plurality of first optical fibers or optical waveguides being divided at one of intersection points of said first optical fibers or optical waveguides and said second optical fibers or

optical waveguides by an optical switch using light-to-light interaction to create dual signals correlated to each other, one of which is a first signal transmitted through within selected said first optical fiber or optical waveguide, and the other of which is a second signal led out from selected said first optical fiber or optical waveguide externally of said two-dimensional plane,

said first signal led out from the other end of selected said first optical fiber or optical waveguide being detected by one of said photo detectors.

18. The photon operating device according to claim 17 wherein said light source is a semiconductor laser.

19. The photon operating device according to claim 17 wherein said first optical fibers or optical waveguides include those for red, those for green and those for blue, a light source for red emission being provided at one end each said first optical fiber or optical waveguide for red, a light source for green emission being provided at one end of each said first optical fiber or optical waveguide for green, and a light source for blue emission being provided at one end of each said first optical fiber or optical waveguide for blue.

20. The photon operating device according to

claim 19 wherein said light source for red emission, said light source for green emission and said light source for blue emission are semiconductor lasers.

21. The photon operating device according to claim 17 wherein said first optical fibers or optical waveguides and said second optical fibers or optical waveguides are disposed to form a curved plane.

22. A photon operating device using dual signals correlated to each other, which are obtained by dividing a photon beam, comprising:

a plurality of optical fibers or optical waveguides having liquid cores and a plurality of control signal lines that are disposed in form of a grating in a two-dimensional plane; and

a light source and a photo detector disposed at one and the other ends of each said optical fiber or optical waveguide,

a photon beam introduced from said light source into selected one of said plurality of optical fibers or optical waveguides being divided at one of intersection points of said optical fibers or optical waveguides and said control signal lines by one of optical switches using light-scattering elements in said cores to create dual signals correlated to each other, one of which is a first signal transmitted through within selected said optical fiber or optical waveguides, and the other of which is a second signal

led out from selected said optical fiber or optical waveguide externally of said two-dimensional plane,

said first signal led out from the other end of selected said optical fiber or optical waveguide being detected by one of said photo detectors.

23. The photon operating device according to claim 22 wherein said light-scattering elements are bubbles.

24. The photon operating device according to claim 23 wherein said bubbles are generated by bringing about cavitation in the liquid forming said core of said optical fiber or optical waveguide.

25. The photon operating device according to claim 23 wherein said bubbles are generated by propagating ultrasonic waves from the outer circumference of said optical fiber or optical waveguide toward the center axis thereof.

26. The photon operating device according to claim 25 wherein said ultrasonic waves are generated by one of piezoelectric elements provided on outer circumferential surfaces of said optical fibers or optical waveguides at intersection points between said optical fibers or optical waveguides and said control signal lines.

27. The photon operating device according to claim 23 wherein said bubbles can be controlled in size.

28. The photon operating device according to claim 23 wherein sizes of said bubbles represent a substantially symmetrical profile about the center axis of each said optical fiber or optical waveguide.

29. The photon operating device according to claim 22 wherein said light-scattering elements are fine particles.

30. The photon operating device according to claim 29 wherein said fine particles are controlled in position by propagating ultrasonic waves from the outer circumference of said optical fiber or optical waveguide toward the center axis thereof.

31. The photon operating device according to claim 30 wherein said ultrasonic waves are generated by one of piezoelectric elements provided on outer circumferential surfaces of said optical fibers or optical waveguides.

32. The photon operating device according to claim 29 wherein said fine particles are controlled in position and/or orientation by introducing an optical field from an optical control element disposed on the outer circumferential surface of said optical fiber or optical waveguide into said optical fiber or waveguide.

33. The photon operating device according to claim 22 wherein said light source is a semiconductor laser.

34. The photon operating device according to

claim 33 wherein said optical fibers or optical waveguides include those for red, those for green and those for blue, a light source for red emission being provided at one end each said optical fiber or optical waveguide for red, a light source for green emission being provided at one end of each said optical fiber or optical waveguide for green, and a light source for blue emission being provided at one end of each said optical fiber or optical waveguide for blue.

35. The photon operating device according to claim 34 wherein said light source for red emission, said light source for green emission and said light source for blue emission are semiconductor lasers.

36. The photon operating device according to claim 32 wherein said optical fibers or optical waveguides and said control signal lines are disposed to form a curved plane.

37. A photon operating method characterized in using dual signals correlated to each other, which are obtained by dividing a photon beam.